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Green

ZTX1049A

25V NPN MEDIUM POWER TRANSISTOR IN E-LINE

Features

- BV_{CEO} > 25V
- I_C = 4A High Continuous Collector Current
- I_{CM} = 20A Peak Pulse Current
- T_J up to +200°C for High-Temperature Operation
- Low Saturation Voltage < 75mV @ 1A
- P_D = 1W Power Dissipation
- **Lead-Free Finish; RoHS Compliant (Notes 1 & 2)**
- **Halogen and Antimony Free. "Green" Device (Note 3)**
- **For automotive applications requiring specific change control (i.e.: parts qualified to AEC-Q100/101/104/200, PPAP capable, and manufactured in IATF 16949 certified facilities), please refer to the related automotive grade (Q-suffix) part. A listing can be found at https://www.diodes.com/products/automotive/automotive-products/.**
- **This part is qualified to JEDEC standards (as references in AEC-Q) for High Reliability. https://www.diodes.com/quality/product-definitions/**

Mechanical Data

- Package: E-Line (TO-92 Compatible)
- Package Material: Molded Plastic, "Green" Molding Compound. UL Flammability Classification Rating 94V-0
- Terminals: Finish – Matte Tin Plated Leads. Solderable per MIL-STD-202, Method 208 e3
- Weight: 0.159 grams (Approximate)

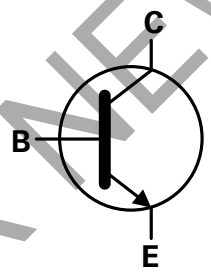
Applications

- LCD backlight converters
- Emergency lighting
- DC-DC converters

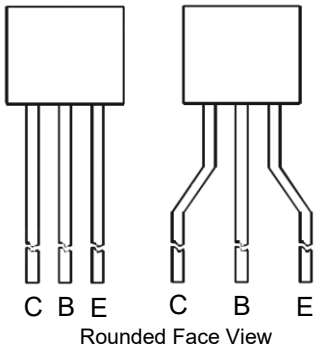
E-Line
(TO-92 Compatible)



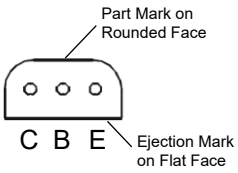
Flat Face View



Device Symbol



Rounded Face View



Bottom View

Pin-Out Configuration

Ordering Information (Note 4)

Orderable Part Number	Marking	Package	Leads	Packing	
				Qty.	Carrier
ZTX1049ASTZ	ZTX1049A	E-Line	Joggled	2,000	Taped per Ammo Box
ZTX1049A	ZTX1049A	E-Line	Straight	4,000	Loose in a Box

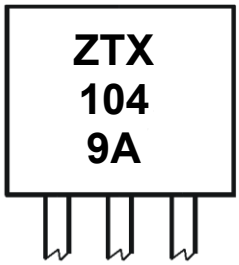
Notes:
1. EU Directive 2002/95/EC (RoHS), 2011/65/EU (RoHS 2) & 2015/863/EU (RoHS 3) compliant. All applicable RoHS exemptions applied.
2. See https://www.diodes.com/quality/lead-free/ for more information about Diodes Incorporated's definitions of Halogen- and Antimony-free, "Green" and Lead-free.
3. Halogen- and Antimony-free "Green" products are defined as those which contain <900ppm bromine, <900ppm chlorine (<1500ppm total Br + Cl) and <1000ppm antimony compounds.
4. For packaging details, go to our website at https://www.diodes.com/design/support/packaging/diodes-packaging/.

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Marking Information



Rounded Face View

ZTX1049A = Product Type Marking Code

Maximum Ratings (@T_A = +25°C, unless otherwise specified.)

Characteristic	Symbol	Value	Unit
Collector-Base Voltage	V_{CBO}	80	V
Collector-Emitter Voltage	V_{CEO}	25	V
Emitter-Base Voltage	V_{EBO}	5	V
Continuous Collector Current	I_C	4	A
Peak Pulse Current	I_{CM}	20	A
Base Current	I_B	500	mA

Thermal Characteristics (@T_A = +25°C, unless otherwise specified.)

Characteristic	Symbol	Value	Unit
Power Dissipation (Note 5)	P_D	1.5	W
Power Dissipation (Note 6)	P_D	1	W
Thermal Resistance Junction to Ambient (Note 5)	$R_{\theta JA}$	116	°C/W
Thermal Resistance Junction to Ambient (Note 6)	$R_{\theta JA}$	175	°C/W
Thermal Resistance Junction to Lead (Note 7)	$R_{\theta JL}$	63.75	°C/W
Operating and Storage Temperature Range	T_J, T_{STG}	-55 to +200	°C

ESD Ratings (Note 8)

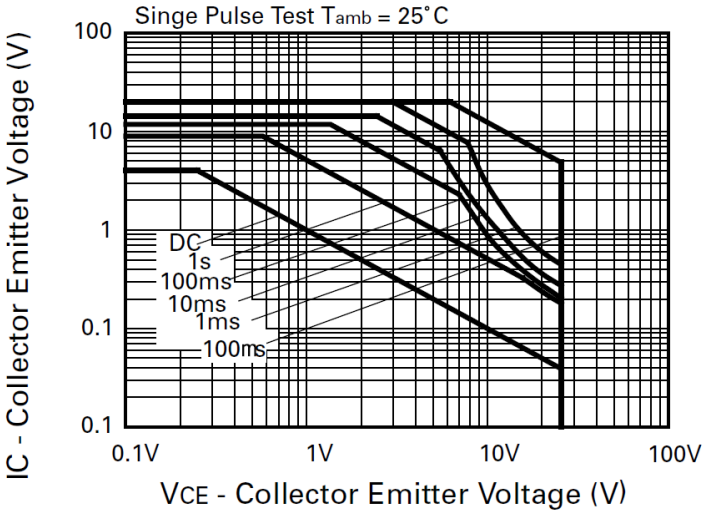
Characteristic	Symbol	Value	Unit	JEDEC Class
Electrostatic Discharge - Human Body Model	ESD HBM	≥ 4,000	V	3A
Electrostatic Discharge - Machine Model	ESD MM	≥ 400	V	C

Notes:
5. For a through-hole device mounted at the seating plane (2.5mm lead length) with the collector lead on 25mm x 25mm 1oz weight copper that is on a single-sided FR4 PCB; device is measured under still air conditions whilst operating in a steady state.
6. Same as Note (5), except the device is mounted on minimum recommended pad layout with 12mm lead length from the bottom of package to the board.
7. Thermal resistance from junction to solder-point at the seating plane (2.5mm from the bottom of package along the collector lead).
8. Refer to JEDEC specifications JESD22-A114 and JESD22-A115.

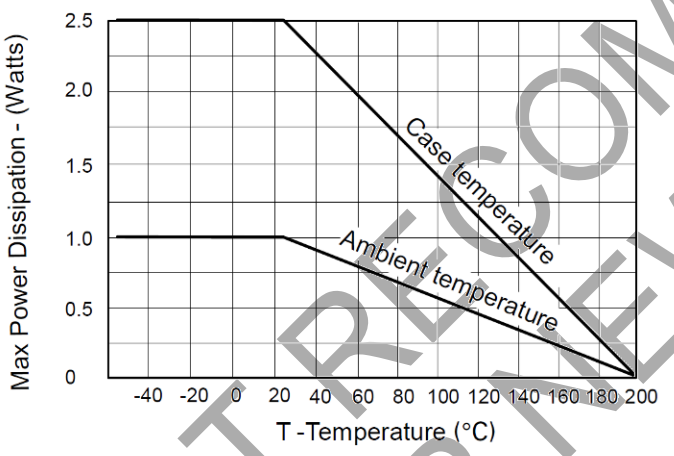
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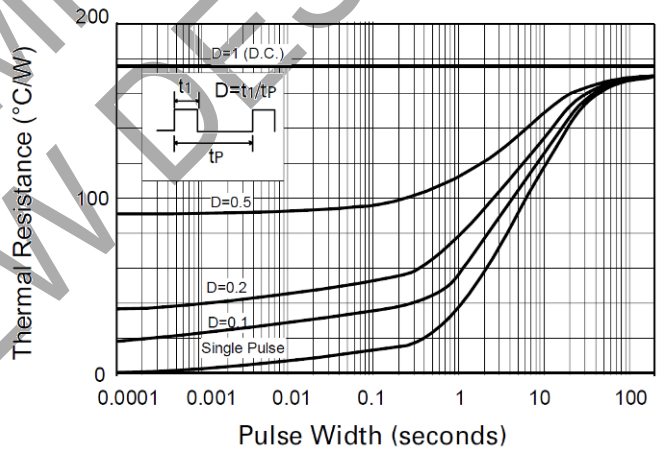
Thermal Characteristics and Derating Information



Safe Operating Area



Derating curve



Maximum transient thermal impedance

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Electrical Characteristics (@T_A = +25°C, unless otherwise specified.)

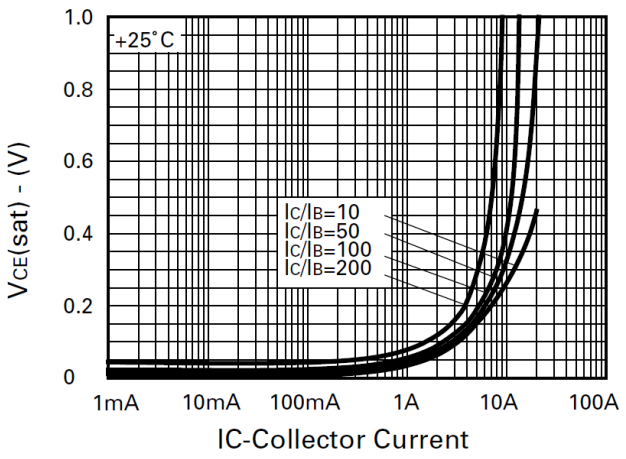
Characteristic	Symbol	Min	Typ	Max	Unit	Test Condition
Collector-Base Breakdown Voltage	BV_{CBO}	80	120	—	V	I_C = 100µA
Collector-Emitter Breakdown Voltage	BV_{CES}	80	120	—	V	I_C = 100µA
Collector-Emitter Breakdown Voltage (Note 9)	BV_{CEO}	25	30	—	V	I_C = 10mA
Collector-Emitter Breakdown Voltage	BV_{CEV}	80	120	—	V	I_C = 100µA, V_{EB} = 1V
Emitter-Base Breakdown Voltage	BV_{EBO}	5	8.75	—	V	I_E = 100µA
Collector Cutoff Current	I_{CBO}	—	0.3	10	nA	V_{CB} = 50V
Collector Emitter Cutoff Current	I_{CES}	—	0.3	10	nA	V_{CES} = 50V
Emitter Cutoff Current	I_{EBO}	—	0.3	10	nA	V_{EB} = 4V
Collector-Emitter Saturation Voltage (Note 9)	$V_{CE(sat)}$	—	30 60 125 155	45 80 180 220	mV	I_C = 500mA, I_B = 10mA I_C =1A, I_B = 10mA I_C =2A, I_B = 10mA I_C =4A, I_B = 50mA
Base-Emitter Saturation Voltage (Note 9)	$V_{BE(sat)}$	—	890	950	mV	I_C =4A, I_B = 50mA
Base-Emitter Turn-On Voltage (Note 9)	$V_{BE(on)}$	—	820	900	mV	I_C = 4A, V_{CE} = 2V
DC Current Gain (Note 9)	h_{FE}	250 300 300 200 35	430 450 450 350 70	— — 1200 — —	—	I_C = 10mA, V_{CE} = 2V I_C = 0.5A, V_{CE} = 2V I_C = 1A, V_{CE} = 2V I_C = 4A, V_{CE} = 2V I_C = 20A, V_{CE} = 2V
Current Gain-Bandwidth Product (Note 9)	f_T	—	180	—	MHz	V_{CE} = 10V, I_C = 50mA f = 50MHz
Output Capacitance (Note 9)	C_{obo}	—	45	60	pF	V_{CB} = 10V, f = 1MHz
Turn-On Times	t_{on}	—	125	—	ns	I_C = 4A, I_B = 40mA, V_{CC} = 10V
Turn-Off Times	t_{off}	—	380	—	ns	I_C = 4A, I_B = 40mA, V_{CC} = 10V

Notes: 9. Measured under pulsed conditions. Pulse width ≤ 300 µs. Duty cycle ≤ 2%.

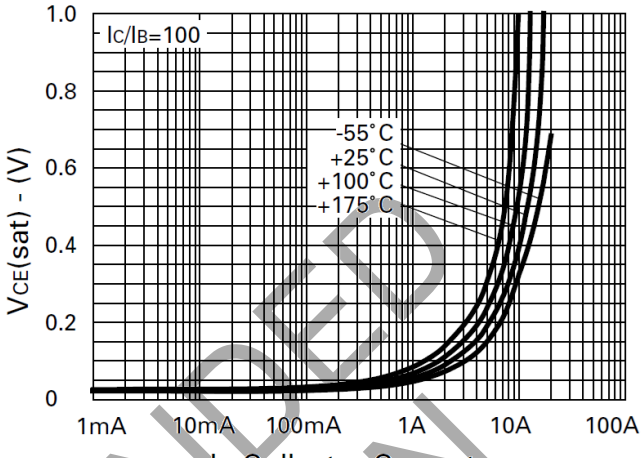
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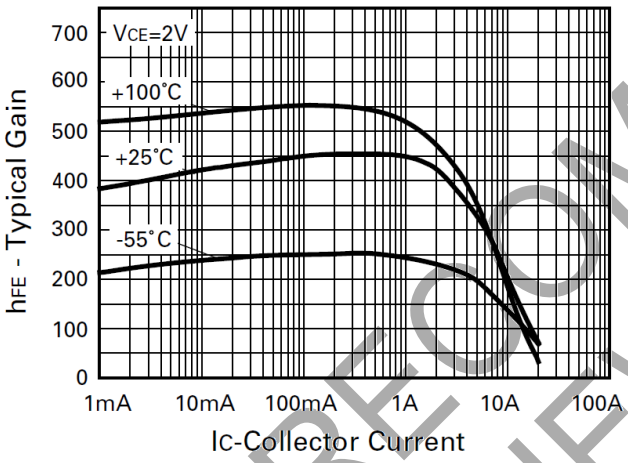
Typical Electrical Characteristics (@T_A = +25°C, unless otherwise specified.)



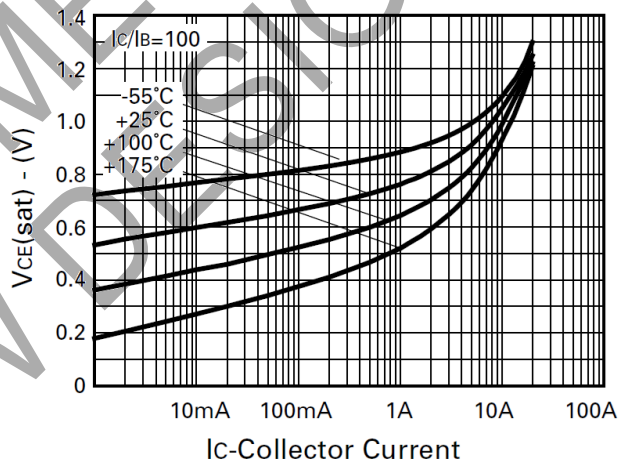
VCE(sat) v IC



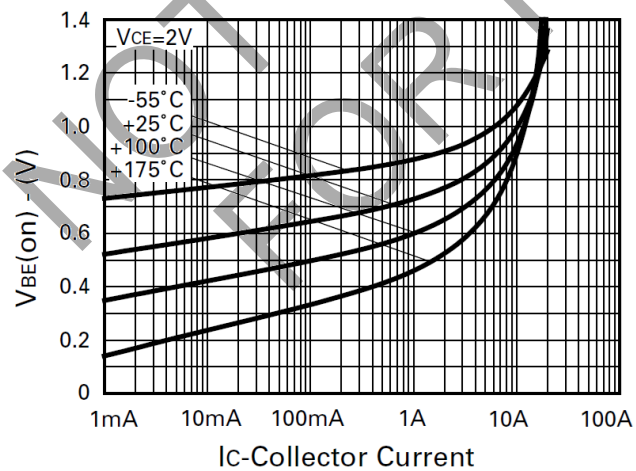
VCE(sat) v IC



hFE V IC



VBE(sat) v IC



VBE(on) v IC

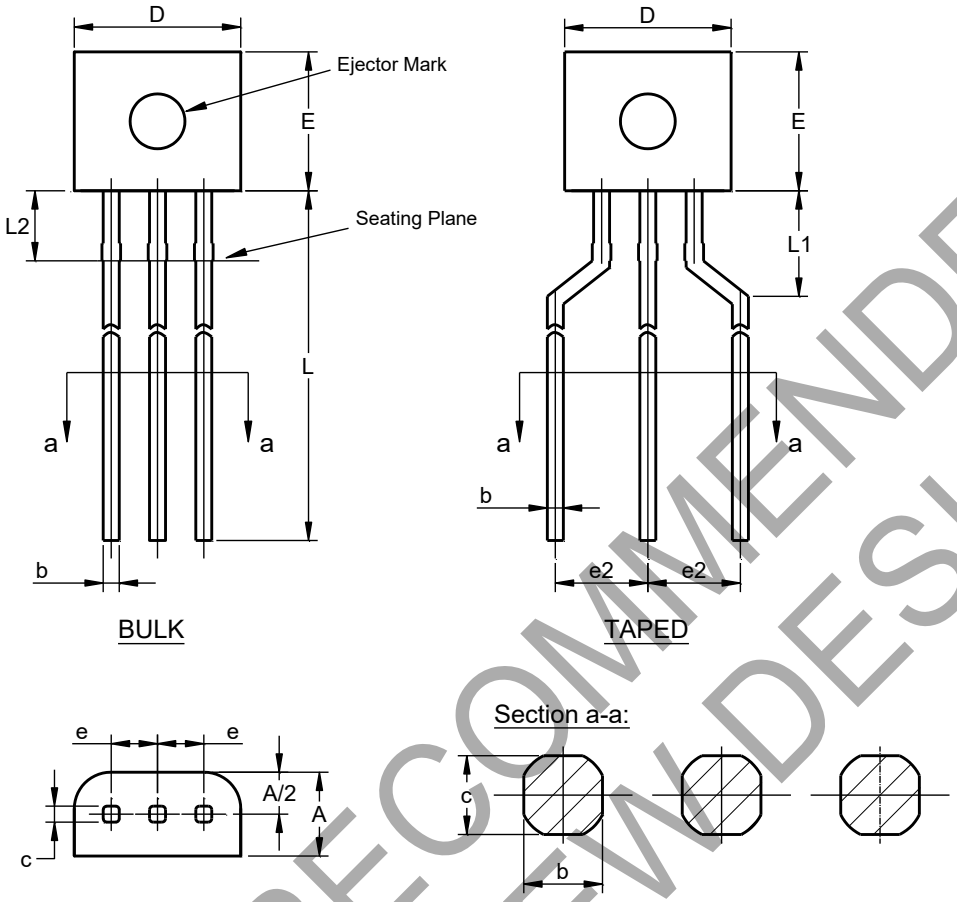
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Package Outline Dimensions

Please see http://www.diodes.com/package-outlines.html for the latest version.

E-Line



E-Line			
Dim	**Min**	**Max**	**Typ**
A	2.16	2.41	2.28
b	0.41	0.49	0.44
c	0.41	0.49	0.44
D	4.37	4.77	4.57
E	3.61	4.01	3.90
e	1.27 REF		
e2	2.54 REF		
L	13.00	13.97	13.50
L1	2.50	3.50	--
L2	--	--	2.50
All Dimensions in mm			

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